REMARKS/ARGUMENTS

Claim 4 has been canceled. Claims 1-3, 5, 6 and 10-24 are active in the case. Reconsideration is respectfully requested.

The present invention relates to copolymers of ethylenically unsaturated acid-group-containing monomers and a hydrophobic monomer component for the prevention of the deposition of inorganic and organic deposits.

Claim Amendments

Claims 1, 13 and 17 have been narrowed in scope by limiting the unsaturated monomer material to a combination of a monoethylenically unsaturated sulfonic acid with monoethylenically unsaturated or monoethylenically unsaturated dicarboxylic acids, which acids are combined with a copolymerizable hydrophobic monocyclic terpene hydrocarbon. The proportion of component (b) in the copolymer is within the range of 0.2 to < 20 wt %. The monomers in any given reaction are radically polymerized to form the water soluble product. Entry of the amended claims into the record is respectfully requested.

Claim Rejection, 35 USC 112

The rejection of Claims 1, 13 and 17 is obviated by the amendments made to each of the claims in which the only monomer constituent (b) is a copolymerizable hydrophobic monocyclic terpene hydrocarbon. The basis for the rejection of Claim 4 is obviated by the cancellation of the claim. Withdrawal of the rejection is respectfully requested.

Claim Rejection, 35 USC 103

Claims 1-6, 10-14, 16 and 22-24 stand rejected based on 35 USC 103(a) as obvious over Fujikake et al, U. S. Patent 6,084,032 in view of Behr et al, U. S. Patent 5,756,624. This ground of rejection is respectfully traversed.

The Examiner states on page 5, lines 10-11 that *both references (Behr et al and Fujikake) are analogous art because they are from the same field of endeavor concerning water-soluble copolymers*. This statement is incorrect. A refutation of this statement is necessary, because the alleged common property of water solubility is the basis on which the two patents have been combined.

The Behr et al patent discloses terpene polymers that are not water-soluble. The terpene polymers disclosed by Behr et al are obtained by radical copolymerization in the absence of solvent, i.e. in the bulk. Note that the patent at column 2, lines 32-34 states that *solvents in the present context are understood to be organic liquids which are capable of dissolving the terpene copolymer or the comonomers or monomers at room temperature*. The water-insoluble polymers are useful as tackifiers in adhesives, and may be used in paints and as binders for printing inks. Further uses include a component of textile sizing agents, builders and hardeners. The property of tackifiers in adhesives and the like are water-free and have nothing in common with the thickeners for various aqueous solutions as disclosed in Fujikake et al. Thus, there is no common basis for combining Behr et al with Fujikake et al. Moreover, one of skill in the art of attempting to provide formulations for the prevention of deposit formation in water-conveying systems, substances or compositions and methods for synthesis thereof that do not exhibit toxicity, but yet are readily prepared from readily available materials and which can be stored for prolonged periods of time without loss of function, would not have considered a document that describes non-aqueous tackifiers.

In considering the water insolubility characteristics of the tackifier of Behr et al, applicants direct the attention of the Examiner to Examples (4a) and (4b) on page 19 of the

present specification where specific formulations within the scope of Example 15 of Behr et al are disclosed. Copolymers prepared from maleic anhydride and orange terpene are described that have weight ratios of 70 %/30 % and 80 %/20 %, respectively. In each case a brown paste was obtained which was not soluble in water. The pastes could only be partially dissolved and dispersed in aqueous sodium hydroxide. 20 % aqueous dispersions of the polymer were used. In fact, as to the dynamic scale inhibition and the relative dispersing capacities for kaolin of the pastes of Exs. (4a) and (4b) versus the Examples 1-3 of the application (only Examples 2 and 3 are based on a copolymer of sodium methallylsulfonate and acrylic acid), reference is made to comparative evidence presented in Table 1a (Exp B1), Table 1b (Exps. VB4a and VB4b (Behr et al)) and Table 2b (Exps B2 and B3). From the data summarized in the following table, it is evident that the polymer compositions of the invention are superior to the polymer compositions of Behr et al. Moreover, the data demonstrate the superiority of the sulfonic acid/monocarboxylic acid combination of the present claims over a copolymer that just contains monocarboxylic acid (acrylic acid). (Example 1 is not within the scope of the invention as claimed in Claim 1.)

Example [B] Comparison [VB]	**B1**	**VB4a**	**VB4b**		
by analogy with patent		US 5756624	US 5756624	**B2**	**B3**
Molecular weight per GPC (Mw)	2500	Not determined	Not determined	1900	1900
Monomer	AcS	MSA/terpene	MSA/terpene	AcS/NaMAS	AcS/NaMAS
Orange terpene proportion in the formulation [%]	6	6	4	0.3	0.3
P-Mac standard scaling quotient	1.2	< 40 minutes	< 40 minutes	0.9	0.5
Kaolin dispersing capacity [%]	83	32	37	86	85
Organic deposit	1			Clear solution	Clear solution
Comment	Clear solution	Brown dispersion in aqueous NaOH	Brown dispersion in aqueous NaOH		
Water-soluble	Yes	Partly	Partly		

As to the important feature of the invention of the combination of an unsaturated monocarboxylic acid or an unsaturated dicarboxylic acid with an unsaturated sulfonic acid in a copolymerization reaction with a monocyclic terpene hydrocarbon, there is not some much as a hint of a teaching or suggestion of the use of an unsaturated sulfonic acid as an acid reactant for a water-soluble copolymer. Nor is there any teaching or suggestion of a combination of the unsaturated sulfonic acid and either unsaturated monocarboxylic acids or unsaturated dicarboxylic acids for reaction with a monocylic terpene. Thus, the cited combination of references does not suggest the invention and withdrawal of the rejection is respectfully requested.

As to the matter of the Werres patent, applicants maintain their position as stated on the record concerning this reference.

It is now believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

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